BASF Aktiengesellschaft

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We claim:

1. A process for the scale-up of a reactor having a supply of a reaction mixture via channels of a burner block to a reaction chamber, a high temperature reaction having a short residence time taking place in the reaction chamber and the reaction mixture subsequently being rapidly cooled in a quench area, characterized in that for a throughput enlargement the internal diameter of the reactor is enlarged, the transition from the reaction chamber to the quench area being designed in the form of a gap which is restricted to a width in the range from 2 to 200 mm.

2. A process as claimed in claim 1, characterized in that the transition of the reaction chamber to the quench area is restricted to a gap having a width in the range from 50 to 150 mm.

3. A reactor having a supply of a reaction mixture via channels of a burner block to a reaction chamber, a high temperature reaction having a short residence time taking place in the reaction chamber and the reaction mixture subsequently being rapidly cooled in a quench area, characterized in that the transition of the reaction chamber to the quench area is designed in the form of an annular gap.

4. A reactor as claimed in claim 3, characterized in that the annular gap is restricted to a width in the range from 2 to 200 mm.

5. A reactor as claimed in claim 3, characterized in that the reaction chamber is designed in the form of an annular gap.

6. A reactor as claimed in claim 3, characterized in that the channels of the burner block are aligned in the longitudinal axis of the reaction chamber.

7. A reactor as claimed in claims 3, characterized in that some of the channels for the supply of the reaction mixture and/or channels for the supply of additional oxygen or of reaction auxiliaries are aligned at any desired angle

to the longitudinal axis of the reaction chamber and otherwise the channels of the burner block are aligned in the longitudinal axis of the reaction chamber.

8. A reactor as claimed in claim 3, characterized in that the quench area is constructed aligning in the direction of the longitudinal axis of the reaction chamber.

9. A reactor as claimed in claim 3, characterized in that the rapid cooling of the reaction mixture in the quench area is brought about by direct or indirect quenching.

10. A reactor as claimed in claim 8, characterized in that the direct quenching of the reaction mixture in the quench area is brought about by single- or multistage mixing of a cooling medium into the reaction mixture.

11. A reactor as claimed in claim 9, characterized in that the direct quenching of the reaction medium in the quench area designed like an annular gap is brought about by direct mixing of cooling medium into the quench area designed like an annular gap from outside and/or from inside.

12. A reactor as claimed in claim 3, characterized in that in the quench area direct quenching is brought about by introducing a cooling medium via quench nozzles which are arranged radially or tangentially to the main flow direction of the reaction mixture in the reactor, where in the case of a multistage introduction of cooling medium a countercurrent positioning of the quench nozzles is preferred.

13. A reactor as claimed in claim 3, characterized in that all surfaces restricting the reaction chamber are formed of a fire-resistant ceramic which is stable at reaction temperature having an alumina content of at least 80% by weight.

14. A reactor as claimed in claim 3, characterized in that the alumina content of the fire-resistant ceramic is at least 95% by weight.

15. A reactor as claimed in claim 3, characterized in that the alumina content of the fire-resistant ceramic is at least 96% by weight.

16. A reactor as claimed in claim 3, characterized in that the fire-resistant ceramic is introduced into the reaction chamber in the form of stones or blocks or as a cast or tamped mass and subsequently compressed, dried and calcined.

17. A reactor as claimed in claim 16, characterized in that the cast or tamped mass is calcined by the high temperature reaction.

18. A reactor as claimed in claim 3, characterized in that the fire-resistant ceramic has a thickness in the range from 7 to 30 cm.

19. A method of using the process as claimed in claim 1 or the reactor as claimed in claim 3 for the preparation of acetylene by partial oxidation of hydrocarbons using oxygen.

20. A reactor as claimed in claim 4, wherein the annular gap is restricted to a width in the range from 50 to 150 mm.

21. A reactor as claimed in claim 8, wherein a quench area is constructed as a gap.

22. A reactor as claimed in claim 21, wherein the gap has an annular shape.

23. A reactor as claimed in claim 10, wherein the direct quenching of the reaction mixture in the quench area is brought about by single- or multistage mixing of an cooling medium into the reaction mixture via one or more annular distributors.

24. A reactor as claimed in claim 18, wherein in the fire-resistant ceramic has a thickness in the range from 8 to 10 cm.